REMARKS

Entry of this Amendment in the above-identified patent application is respectfully requested. With this Amendment, claim 19 has been canceled without prejudice, and new claim 21 has been added. Claims 1-16 and 20 have been amended. After entry of this Amendment, claim 1-18, 20 and 21 remain pending in the Application. In the Office Action marked final and dated April 28, 2002, the Examiner rejected claims 1-3, 5, 6, 19 and 20 under 35 U.S.C. § 102(b). The Examiner rejected claims 11, 12 and 20 under 35 U.S.C. § 103(a). Finally, the Examiner indicates that claims 4, 7-10 and 13-18 are allowable. It is respectfully submitted that for the reasons set forth hereinafter the Applicant's invention as defined by the claims is not anticipated or rendered obvious by the cited prior art either individually or in the combinations posed by the Examiner. Reconsideration of the Examiner's rejections is respectfully requested.

In this Amendment, the Applicant has amended the European two-part claims of claims 1-16 to conform more closely to U.S. practice. In particular, the Applicant has replaced the transition phrase "characterized in that" with an another transition phrase in each of claims 1-16, and made some minor conforming changes. Additional changes to the claims are discussed herein.

To change the format the independent claim 1, each element of the claim is now included in the body of the claim. In addition to this change to claim 1, the language "for rotary securing of the driven shaft especially when the electric motor drive is disengaged, a wrap-spring brake working against the gear box" has been rearranged and clarified to state the element as "a wrap-spring brake working against the gear box including a wrap spring securing the driven shaft against rotation upon disengagement of the electric motor drive." This change replaces the language "especially when the electric motor drive is disengaged" and provides antecedent basis for the wrap spring recited later in the claim. Finally, the annular element has been stated positively by reciting a wrap-spring brake including "an annular element mounted free of torsion on the gear box and positioned between the wrap spring and the gear box, the annular element diverting into the gear box a moment of torsion introduced by the driven shaft." Dependent claim 3 now positively states that the annular element is locked into the gear box, instead of can be locked into the gear box. Claim 5 states that the side of the sun wheel facing toward the wrap spring has a

plurality of lands curved in cross section, around which the wrap spring is positioned. As is clear from the specification, the lands do not have to be circular.

The Examiner rejects independent claim 1 and its dependent claims 2, 3, 5, 6, and 19 under 35 U.S.C. § 102(b) as being anticipated by Ciolli (5,573,472). It is respectfully submitted that Ciolli fails to teach or suggest all of the features of claim 1. The U.S. Patent and Trademark Office defines wrap-spring brakes in classification 192/223.4 as "[s]ubject matter wherein the device to retard or stop rotation of the output load is a helically coiled resilient element which expands or contracts radially to frictionally engage a member to be braked." Claim 1 makes explicit what was previously implicit in the claim, that a wrap spring secures the driven shaft against rotation upon disengagement of the electric motor drive. Ciolli does not show a wrap-spring brake as known by those skilled in the art because the wrap spring 90' of Ciolli does not brake the shaft 26', i.e., it is not used for securing the shaft 26' against rotation. Ciolli uses a wrap spring in a downshift mechanism for dual speed/dual torque drive mechanisms. In operation, the wrap spring 90' is concentrically disposed about the spring drive drum 32'. (Ciolli, col. 8, ll. 40-41, 48-51). As the drive motor 14 rotates in a clockwise direction indicated in Fig. 4, the wrap spring 90' unwinds and commences slipping on the spring drive drum 32'. (Id., ll. 52-54 and col. 9, ll. 10-14). At low torque levels, the wrap spring 90' locks the ring gear 66' to the shaft 26' through the wrap spring connection to the ear/lug 86'. (Id., ll. 14-17). This is the direct drive mode of the output shaft 50'. (Id., ll. 17-19). As the torque increases, the wrap spring 90' contacts the inner face of the spring sleeve 138 and the reaction sleeve 160, locking the spring sleeve 138 and the ring gear hub 70' to the reaction sleeve 160 on the housing 12'. (Ciolli, col. 9, ll. 19-33). The ring gear 66' of the ring gear hub 70' are stationary, so the planetary gear assembly 44' conventionally reduces the speed and increases the torque of the output shaft 50' relative to the shaft 26'. (Id., ll. 33-39). This is the reduced speed drive mode of the output shaft 50'.

The Examiner states that the ball bearing assemblies 156 and 38' are used with the wrap spring 90' for rotary securing the shaft 26'. However, neither the wrap spring 90' nor the assemblies 156, 38' secure the shaft 26' against rotation. The ball bearing assembly 38' allows the shaft 26' to rotate at a different speed from the output shaft 50' when the spring sleeve 138 and the ring gear hub 70' are locked to the reaction sleeve 160 on the housing 12'. The ball bearing

assembly 156 allows the shaft 26' to rotate in the housing 12' during both the direct drive and the reduced speed drive operations. The shaft 26' can rotate in either direction without regard to the winding and unwinding of the spring 90'. For the foregoing reasons, Applicant's invention as defined in claim 1 and its dependent claims 2, 5, 6, 11 and 12 is neither taught nor suggested by Ciolli.

In addition to the reasons stated with respect to claim 1, from which claim 5 depends, it is respectfully submitted that Ciolli fails to teach or suggest the feature of claim 5 and its dependent claims 6, 11 and 12 that the planetary gear drive has a sun wheel as the gear input shaft. The Applicant agrees that Ciolli has a planetary gear assembly 44'. However, the planetary gear assembly 44' does not have a sun wheel, such as the sun wheel 28 shown in Applicant's Figures 1, 2 and 8. The gear input shaft of Ciolli is the input shaft 26', which is acknowledged by the Examiner. The shaft 26' is not a separate sun wheel, nor would it be obvious to include a sun wheel due to Ciolli's need to engage and disengage the ring gear hub 70' from rotating with the shaft 26'. Further, Ciolli does not teach or suggest that the side of the sun wheel facing toward the wrap spring has a plurality of lands curved in cross section, around which the wrap spring is positioned. The wrap spring 90' is positioned around the drive drum 32', and the drive drum 32' does not have a plurality of lands curved in cross section, around which the wrap spring 90' is positioned. Thus, the invention defined by claim 5 and its dependent claims 6, 11 and 12 is neither taught nor suggested by Ciolli.

It is additionally submitted that Ciolli fails to teach or suggest the feature of claim 6 that the planetary gear drive has planets, which roll off on the inner toothing on the inner side of the gear box. In Ciolli, the planet gears 62' of the planetary gear assembly 44' rotate with the gear teeth 68' of the ring gear hub 70' at low torque levels. (Ciolli, col. 9, ll. 14-19). At higher torque levels, the ring gear hub 70' is stationarily locked to the reaction sleeve 160 and the housing 12'. (Id., ll. 33-36). The wrap spring downshift mechanism 20' would not work without the presence of the ring gear hub 70' between the planet gears 62' and the housing 12'. Thus, in addition to the reasons set forth with respect to claims 1 and 5, from which claim 6 depends, Applicant's invention as defined by claim 6 is not anticipated or rendered obvious by Ciolli.

The Examiner rejects claims 11 and 12 under 35 U.S.C. § 103(a) as being unpatentable over Ciolli in view of Ozaki (4,587,450). It is respectfully submitted that the addition of Ozaki to Ciolli fails to teach the features of claims 1 and 5, from which claims 11 and 12 depend. Specifically, the combination fails to teach a wrap-spring brake as defined in claim 1 and fails to teach a sun wheel with a plurality of lands as defined in claim 5 because neither Ciolli nor Ozaki teach these features. Thus, for the reasons stated with respect to claims 1 and 5, the combination of Ciolli and Ozaki fails to teach or suggest all of the features of claims 11 and 12, even if such a combination were taught or suggested by the art.

Claims 4 and 7 have previously been indicated as allowable, and were rewritten to independent form. Similar to claim 1, claims 4 and 7 have also been rewritten to include each element of the claim in the body of the claim, instead of the preamble. In addition, similar changes have been made to the description of the wrap-spring to clarify that element in each claim. Specifically, a wrap-spring brake working against the gear box has been clarified to include a wrap spring securing the driven shaft against rotation upon disengagement of the electric motor drive and an annular element positioned between the wrap spring and the gear box, the annular element diverting into the gear box a moment of torsion introduced by the driven shaft. This change replaces the language "especially when the electric motor drive is disengaged," provides antecedent basis for the wrap spring recited later in the claim, and recites the annular element. In addition, as discussed with respect to claim 5, the description of the lands being circular has been removed from claim 7, as this is not a needed feature of the claim as is clear from the specification. It is respectfully submitted that claim 4, claim 7, and claims 8-10 and 13-18, which depend from claim 7, are allowable over the prior art of record.

Claim 20 has been amended to remove the requirement that the electric motor drive be located in a motor housing to clarify that the electric motor drive does not have to be in a separate motor housing. The driven shaft is still described as being located in the gear box. Further, the element in the preamble whereby the reducing gear couples the drive shaft with a driven shaft no longer includes the requirement that the coupling be via a gear input shaft and a gear box supporting the reducing gear and the driven shaft. The wrap-spring brake has been clarified to state the element being braked by stating that the wrap-spring brake secures the driven

shaft from rotating opposite a direction of rotation of the electric motor drive. To do this, the wrap spring is described as operatively coupled to the driven shaft. New dependent claim 21 explains one way in which the wrap spring can be operatively couple to the driven shaft. Namely, the reducing gear includes a planetary gear assembly, and the improvement further comprises a sun wheel. The sun wheel includes a gear input shaft driving at least one planet of the planetary gear assembly and at least one land radially disposed from the gear input shaft. The wrap spring is positioned around and engageable with the at least one land to rotate with the sun wheel in the direction of rotation of the electric motor drive.

The Examiner rejects independent claim 20 under 35 U.S.C. § 102(b) as being anticipated by Ciolli (5,399,129). It is respectfully submitted that Ciolli fails to teach a wrap-spring brake, as mentioned above with respect to claim 1. It is further submitted that Ciolli does not teach or suggest all of the features of claim 20 because it does not teach or suggest an annular element that absorbs a moment of torsion resulting from the effort of the shaft 26' to rotate opposite the direction of rotation of the electric motor drive, which is described as clockwise as shown by the arrow in Fig. 4. When the shaft 26' rotates in the counter-clockwise direction, the spring 90' tightens on the drive drum 32'. The overrunning clutch assembly 34' permits this counterclockwise rotation, absorbing the torque. (Ciolli, col. 9, ll. 39-53). The reaction sleeve 160 does not absorb this moment of torsion because the spring 90' does not expand when the shaft 26' is rotating opposite the direction of rotation of the electric motor drive. For the foregoing reasons, the invention defined by claim 20 and its dependent claim 21 is not anticipated or rendered obvious by Ciolli.

Finally, the Examiner rejects claim 20 as being rendered obvious by the addition of Shimanckas (3,669,058) to the preamble of claim 20, which is in Jepson form. The Applicant respectfully submits that Shimanckas is not art that one of skill in the art of tube motors would consider. First, it is submitted that Shimanckas is non-analogous art to the present invention. Shimanckas is directed to preventing back steering of an outboard motor, while permitting steering action in response to the operation of a user. (Shimanckas, col. 2, ll. 35-37). Shimanckas is accordingly classified in Class 440/55 Marine Propulsion, which is directed to significantly claimed vessel structure or a claimed modification of vessel structure regardless of

the structure of the outboard motor, and specifically to restraining means for preventing the movement of the propulsion unit from its normal operating position. The present invention is directed to a wrap-spring brake in a tube motor. The Applicant identifies a problem in the prior art of tube motors as being the direct coupling of the wrap spring with the gear housing. There is no motivation to look to Shimanckas, even if Shimanckas were analogous art.

Further, even if Shimanckas were considered to be prior art to the present invention, the combination of the tube motor prior art of the preamble of claim 20 with Shimanckas would not render the present invention obvious because it would still fail to teach or suggest all of the features of claim 20. The Examiner states that the driven shaft is element 111, and states that it would have been obvious to combine the references for the purpose of absorbing a moment of torsion. It is respectfully submitted that element 111 is not a driven shaft of the motor. The releasing shaft 111 is operated by the user in either the clockwise or counterclockwise direction as shown in Fig. 2 to release the spring 57 to permit relative movement between the king pin 27 and the propulsion unit 33 relative to the swivel bracket 17. (Shimanckas, col. 3, line 56 to col. 4, line 6). The wrap spring 57 is solely used to lock the king pin 27 to the swivel bracket 17 so that the propulsion unit 33 does not cause unwanted steering movements. Since the releasing shaft 111 actually releases the spring 57 from engagement with the swivel bracket sleeve 59, against which it is normally biased, (id., col. 3, ll. 1-10), the sleeve 59 does not absorb a moment of torsion resulting from the effort of the releasing shaft 111 to rotate opposite a direction of rotation of the electric motor drive (not shown), whichever way that drive rotates at any particular point in time. Since the combination of Shimanckas and the tube motor described by the Applicant does not teach all of the elements of claim 20, even if such a combination were permissible, the combination fails to render the invention defined in claim 20 or in claim 21 obvious.

In addition to the fact that the cited references fail to teach or suggest all of the features of claim 20, it is respectfully submitted that the invention defined in dependent claims 21 is novel and unobvious because none of the cited references teach or suggest a sun wheel as described by the Applicant.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification,

claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

1. (Three times amended) A tube motor [with]comprising:

an electric motor drive with a drive shaft located in a motor housing[,];

a reducing gear with a driven shaft coupled with the drive shaft via a gear input shaft[,];

a gear box supporting the reducing gear and the driven shaft[,]; and[, for rotary securing of the driven shaft especially when the electric motor drive is disengaged,]

a wrap-spring brake working against the gear box, [characterized in that] including a wrap spring securing the driven shaft against rotation upon disengagement of the electric motor drive and an annular element mounted free of torsion on the gear box and positioned between the wrap spring and the gear box [is an annular element, which diverts], the annular element diverting into the gear box a moment of torsion introduced by the driven shaft.

2. (Three times amended) The tube motor according to Claim 1, [characterized in that] wherein the inner side of the gear box has an inner toothing and a jacket surface of the annular element facing toward the inner side of the gear box has a corresponding inner toothing.

3. (Three times amended) The tube motor according to Claim 1, [characterized in that] wherein the annular element [can be] is locked into the gear box.

4. (Four times amended) A tube motor [with]comprising:

an electric motor drive with a drive shaft located in a motor housing[,];

a reducing gear with a driven shaft coupled with the drive shaft via a gear input shaft[,];

a gear box supporting the reducing gear and the driven shaft; and

a wrap-spring brake working against the gear box, [characterized in that,] including a wrap spring securing the driven shaft against rotation upon disengagement of the electric motor drive and an annular element positioned between the wrap spring and the gear box [is an annular element, which diverts], the annular element diverting into the gear box a moment of torsion introduced by the driven shaft [especially when the electric motor drive is disengaged] and the annular element has one of locking hooks and locking indentations on its periphery which can be engaged together with one of locking indentations and locking hooks respectively located on the inner side of the gear box.

5. (Four times amended) The tube motor according to Claim 1, [characterized in that] wherein the planetary gear drive has a sun wheel as the gear input shaft and the side of the sun wheel facing toward the wrap spring has a plurality of [circular] lands curved in cross section, around which the wrap spring is positioned.

6. (Three times amended) The tube motor according to Claim 5, [characterized in that] wherein the planetary gear drive has planets, which roll off on the inner toothing on the inner side of the gear box.

7. (Three times amended) A tube motor [with]comprising:

an electric motor drive with a drive shaft located in a motor housing[,];

a reducing gear with a driven shaft coupled with the drive shaft via a gear input shaft[,];

a gear box supporting the reducing gear and the driven shaft; and

a wrap-spring brake working against the gear box, [characterized in that,] including a wrap spring securing the driven shaft against rotation upon disengagement of the electric motor drive and an annular element positioned between the wrap spring and the gear box [is an annular element, which diverts], the annular element diverting into the gear box a moment of torsion introduced by the driven shaft [especially when the electric motor drive is disengaged] and wherein the reducing gear has a planetary gear drive, [while] and the planetary gear drive has

a sun wheel as the gear input shaft and the side of the sun wheel facing toward the wrap spring has a plurality of [circular] lands curved in cross section, around which the wrap spring is positioned.

8. (Twice amended) The tube motor according to Claim 7, [characterized in that] wherein one land has a shoulder for receiving the one end of the wrap spring oriented on the longitudinal axis of the tube motor.

9. (Three times amended) The tube motor according to Claim 7, [characterized in that] wherein the side of the driven shaft facing toward the wrap spring has a plurality of receiver lands, which engage with a defined play in the free spaces between the lands of the sun wheel.

10. (Three times amended) The tube motor according to Claim 9, [characterized in that] wherein one receiver land has a shoulder for receiving the other end of the wrap spring oriented on the longitudinal axis of the tube motor.

11. (Four times amended) The tube motor according to Claim 5, [characterized in that] wherein the sun wheel has a core, the core and the sun wheel comprising different materials.

12. (Three times amended) The tube motor according to Claim 5, [characterized in that] wherein the sun wheel has a core and the core has one of a hexagonal cross section and a Torx cross section.

13. (Three times amended) The tube motor according to Claim 9, [characterized in that] further comprising:

a cogwheel gear [is] positioned between the drive and the drive shaft.

14. (Twice amended) The tube motor according to Claim 13, [characterized in that] wherein the drive shaft of the drive has an obliquely toothed pinion, which pinion drives at least one cogwheel running axially to the drive shaft.

15. (Twice amended) The tube motor according to Claim 14, [characterized in that] wherein at least one cogwheel is rotatably mounted on a cogwheel axis and that the cogwheel axis is located on the side of the gear box facing toward the wrap-spring brake.

16. (Three times amended) The tube motor according to Claim 14, [characterized in that] wherein at least one cogwheel has a second reducing stage designed as a pinion driving a ring gear.

18. (Three times amended) The tube motor according to Claim 16, [characterized in that] wherein the side of the ring gear remote from the drive forms the drive shaft working together with the wrap-spring brake and the gear input shaft.

Please cancel claim 19 without prejudice.

20. (Amended) In a tube motor including an electric motor drive mounted on a drive shaft [and located in a motor housing,] and a reducing gear coupling the drive shaft with a driven shaft [via a gear input shaft and a gear box supporting the reducing gear and the driven shaft] located in a gear box, the improvement comprising:

a wrap-spring brake securing the driven shaft from rotating opposite a direction of rotation of the electric motor drive, the wrap-spring brake including:

a [wrap-spring] wrap spring operatively coupled to the driven shaft; and

an annular element fixedly mounted in the gear box and surrounding the [wrap-spring] wrap spring, the annular element absorbing a moment of torsion resulting from the effort of the driven shaft to rotate opposite [a]the direction of rotation of the electric motor drive.

New claim 21 is added.